

MOVING ON LPG

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by

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1. Ladies and Gentlemen, I thank you for inviting me to address you again on the important issue of LPG as an alternative fuel for vehicles in Hong Kong.
2. I will first highlight the main points covered in my earlier submission (6.11.98) and then address aspects of the New Zealand LPG model as they may apply to Hong Kong moving on LPG.
 - 2.1 I have had-first hand experience with two 4L saloon cars (six seater Ford Falcons) running on alternatives to petrol or diesel. One vehicle was converted from petrol to CNG (compressed natural gas which is methane), while the other was converted to LPG (mainly propane). In both cases there was a reduction in maintenance costs with LPG being the best in terms of savings (a 15-20% reduction in annual maintenance costs). I will focus on the LPG experience in this submission.

In addition, the unit cost of LPG was ~45% cheaper than that of petrol. Thus LPG, a very clean fuel, was similar in cost to that of diesel.
 - 2.2 The alternative fuel scheme became a government led project. It reached a peak in popularity in the 1980's. Lower and relatively stable oil prices in recent years has tended to work against the earlier popularity of LPG. The price gap between petrol and LPG narrowed. But a steady modest number (2-3 per month at the biggest Auckland conversion firm) of petrol cars are converted. Most of them are taxis.
 - 2.3 In my first submission, I strongly supported the LPG Taxis scheme for Hong Kong, but also advocated a broader based scheme to cover petrol cars and diesel minibuses.
 - 2.4 The need for a THINK BIG approach to LPG in Hong Kong was presented. Such an approach should be based on a Cost-Benefit Analysis (CBA) which looked at quality of life issues in Hong Kong such as environmental health as well as the excitement and opportunities of new infrastructural industries associated with LPG expansion.

3. Features of the NZ LPG model of relevance to Hong Kong.

3.1 *Promotion*

The key was money! LPG was much cheaper than petrol and slightly cheaper than diesel. The Government gave a nation-wide publicity boost to the advantages of LPG: cheaper and cleaner. The energy levels of LPG were close to that of petrol. Vehicle owners who towed horse floats to horse racing venues around New Zealand (there are many Jockey Clubs in NZ!) could do so using LPG as a fuel without significant power loss. Indeed, LPG is more energetic than diesel.

Banks provided low interest loans. These were used to purchase conversion kits imported from Italy or the U.S. Today the cost of converting an existing petrol car to LPG is ~HK\$10,000. Note: the converted vehicle is a dual fuel vehicle. It runs on LPG or petrol. A dash board switch controls the conversion. Thus in remote areas without LPG fuel stations, the vehicle can switch over to petrol. Later, it can be switched back again to LPG.

3.2 *Financial incentives*

These were clear. LPG was ~45% cheaper than petrol. Many LPG users were happy about reduced running costs. LPG is a cleaner fuel both for the engine and for the environment.

The bank loan for conversion costs could be paid back from fuel savings in 12-18 months, depending on the mileage (distance travelled). In N.Z. this is relatively easy as the population is dispersed over two big, long islands. People travel long distances. Around town, too, LPG was popular. BIG people with big families could afford a big car. Cars are essential in NZ towns, eg Auckland (population 1.1 million) is spread over a huge area. Public transport exists but is not popular. People love cars.

Clearly, LPG was a winner.

3.3 *LPG re-fueling stations*

Most petrol stations became multi-fuel stations: petrol, diesel (big trucks mainly) LPG and even CNG. CNG was more complicated. Pipe lines from gas fields had to be laid to deliver the gas. LPG, in contrast, could be delivered by tankers (as for petrol). Thus even remote areas often had LPG facilities. The fact that cities in many countries have LPG facilities underscores the flexible and practical nature of this fuel (see 3.3, page 9 in the Consultation Paper "A Proposal to Introduce LPG Taxis")

3.4 *Converting existing diesel vehicles to LPG*

This is possible technically. Some diesel fork hoists used on the Auckland waterfront have been converted to LPG. This is not common however and technically more complex (and expensive!) than converting petrol vehicles to dual fuel, LPG/petrol engines.

Thus for Hong Kong, the key issue and most sensible idea is to either convert petrol taxis/cars to LPG and/or start with a purpose built (new) LPG powered taxi fleet.

3.5 *Training mechanics: LPG servicing skills*

To ensure the success of the NZ LPG scheme, mechanics were offered evening school short courses in LPG kit installation and maintenance, tune-up etc of LPG dual fuel vehicles. These were certified and monitored for high standards. Such courses provided the opportunity to fine tune the skills of mechanics in both petrol and LPG systems. This resulted in better running (less waste gases eg lower hydrocarbon emissions) of vehicles.

Most LPG skill upgrade courses were run at Polytechnics. Some in house skill transfer also took place. Those with an LPG endorsement to a trained mechanics certificate could ensure that all mechanics in a given service garage/centre were LPG aware.

The LPG promotion scheme gave a boost to mechanic re-training and skill enhancement.

4. **Alternatives and Co-lateral action**

4.1 Alternatives to LPG include, CNG, battery, solar energy and, of course petrol. The CNG option is not realistic for Hong Kong. The environmental impacts (EI) of building a network of CNG pipes all over SAR would be costly and expensive. At present the technologies for battery-driven vehicles do exist but such vehicles are expensive and require a major re-structuring of support systems. Likewise, solarpowered cars do exist but are at the prototype stage of development. Battery powered

and solar cars are vehicles of the future: 2020 perhaps?

4.2 *Co-lateral actions*

Many diesel vehicles are 'spotted' in Hong Kong (27,000 in 1997). The visible gases (with high levels of particulate matter of significance to environmental health professionals) are due to three main factors:

- i) Low quality diesel fuel (DF)
- ii) Poorly maintained and serviced vehicles
- iii) Sub-standard/inappropriate driving skills.

Enhanced policing and meaningful penalties can address (i) and (ii). To improve on (iii) education and training is needed. This is, in itself, a big issue. I will touch on one important aspect of driving skill and style here as an example.

Gear changing at the wrong time

While a good number of drivers using diesel vehicles do use the gears appropriately, many do not. Some change to a higher gear when the engine revolutions/power is not ready. This happens typically on an incline in the road. The result is extra work by the engine and more smoke is released via the exhaust pipe into the roadside atmosphere. The short burst, slow-slow, quick-quick style of driving also contributes to fume production. Both gear changing and unnecessary acceleration bursts can be modified. This is a behaviour and training issue and could be examined as a small but desirable contribution to better driving in Hong Kong.

5. Conclusion

As suggested in my earlier submission the LPG question presents Hong Kong of today with a grand opportunity. There are many positive ways forward with LPG. Some of the features of the NZ model which could, in my view, work here include:

- * Financial incentives to go with LPG.
- * Government interest-free loans to taxi Co. to introduce new LPG powered taxis in the Year of the Rabbit (1999).
- * Tax incentives, eg minimal tax on LPG.
- * LPG training courses to be available and free to mechanics (a sort of government sponsored LPG training scheme). This would give it status (SAR Government backs LPG) and no excuse not to take the course.
- * LPG the Hong Kong Way - a scheme for all, not just taxis: this may take the burden and focus of taxis and place the responsibilities and opportunities of urban air quality enhancement on the shoulders of all car owning citizens.
- * Start a LPG trend eg a top person, movie star 'runs on LPG'. This might get over the false idea that LPG is a 'slow fuel' compared to petrol.
- * Make taxi drivers and their Co. Managers who convert to LPG, 'heroes of Hong Kong'.
- * Link the SAR promoted LPG scheme to tourism ... a sort of brave new Hong Kong running clean in the Year of the Rabbit!

I will stop here. Thank you and best wishes.

Onward!

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